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BEHAVIORAL DIFFERENCES OF FEMALE SPRUCE GROUSE

UNDERTAKING SHORT AND LONG MIGRATIONS

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BEHAVIORAL DIFFERENCES OF FEMALE SPRUCE GROUSE UNDERTAKING SHORT AND LONG MIGRATIONS

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INTRODUCTION

Like many North American Tetraoninae, Spruce Grouse (*Dendragapus canadensis franklinii*) migrate between summer and winter ranges (Herzog and Keppie 1980). The distance and direction of migration varies among individuals, as does the timing of movement, and the behavior of migrating birds. The migration of adult Spruce Grouse was suggested to be a retracing of their dispersal movements as yearlings when about 9 months old.

In an attempt to address possible factors influencing movements, this study examines behavioral data from radio-tracked females exhibiting short and long-distance migratory movements. Two general aspects of female Spruce Grouse behavior that were analyzed included the variability in timing of migratory movements and social behavior during winter. If behavioral differences exist among individual females undertaking migrations, it may suggest different proximal causes for the observed events and thereby open further avenues for study.

METHODS

Spruce Grouse were radio-tracked in 1974-5, 1977, and 1982-4 near the R. B. Miller Biological Station in southwestern Alberta. The main study area consisted of 555 ha of forest dominated by lodgepole pine (*Pinus contorta*), with scattered clumps of white spruce (*Picea glauca*) and poplar (*Populus* spp.). Because many of the surrounding areas consisted of different habitat types, only behavioral data obtained on the main study area were used. Radio

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transmitters were attached to some females in 1974-5, 1977, and 1984, and to all females in 1982-3. Migration distances were determined by measuring the distance between the median location (calculated from all sightings) of a bird's summer and winter ranges. An arbitrary distance of 2 km was used to separate long and short migrations. This distance appeared to be a natural dividing point in the distribution of distances. The timing of migration was determined for radio-tagged birds (only birds migrating > 400 m were used) that were tracked frequently. Variability in the timing of movements was compared for long and short migrants. Flocking behavior in winter was analyzed by examining the composition and stability of flocks.

RESULTS

Females migrated distances varying from essentially 0 to > 11 km with a median distance of about 0.5 km. Females were usually observed on their winter range for the first time about 23 September and on their summer range on 26 April. As a group, long-distance migrants were significantly less variable in their dates of movement than short-distance migrants.

Some of the variability in the timing of migratory movements appeared to reflect repeated migratory trips during a single season. For example, some females were recorded moving to their winter range, returning to their summer range, and finally moving back to their winter range, all during a single fall season. This type of movement was observed in 15 females during this study. All but one were short-distance migrants. The one exception was a female that moved 2.1 km, marginally greater than the separation point between long and short-distance migrants (2 km).

An examination of flocking data showed that long-distance female migrants flocked together with other birds significantly more than did short-distance migrants. The difference appeared to reflect their association with other adult females as opposed to flocking with non-females. A more detailed examination of flocks containing more than one female, showed that long and short-distance migrants did not differ in regard to flocking with long-distance migrants. However, adult females that were short-distance migrants associated significantly less

often with other short-distance migrants than did long-distance migrants. Furthermore, when the composition of stable flocks (females together on consecutive sightings) are analyzed, long-distance migrants are shown to be more common than short-distance ones. This occurred despite the fact that short-distance migrants outnumber long-distance ones by approximately 2:1 in the Gorge Creek population.

DISCUSSION

The results of this study suggest that there may be two types of female Spruce Grouse, differing in their behavior relative to migration distance. If migratory movements are a retracing of their dispersal movements as immature birds, the behavior of the birds involved may suggest proximal causes for their original movement. For example, if short-distance dispersers are looking for a place to breed during their first winter (Alway and Boag 1979), they may display more spatial segregation with respect to other potential breeders. This might explain why short-distance migrants are apparently avoiding other females, and especially other short-distance migrants. It could also explain why they display variable patterns of movement as opposed to the relatively fixed migratory behavior of long-distance migrants. Alternatively, long-distance migrants, which would not be immediate competitors for potential breeding space, may display more tolerance toward other females.

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